

### The Processes of Learning Math\*

In math, our instructional focus often emphasizes important **content** areas- Counting, Operations, Geometry, Measurement, Data Collection and Analysis. Just as important are the **Ways** that we approach math, and the thinking skills that help us make sense of math concepts **across** content areas. These thinking skills, identified as **Process** Skills by the National Council of Teachers of Mathematics [NCTM]\* are present in all quality math instruction. We have been using them from the first day that we implemented our *Math for ME* curriculum.

- Problem-Solving- Each Unit presents ways that we can apply math to solve problems in books, in our classroom, and in the course of everyday living.
- Reasoning and Proof- When we ask children to “Show me how you did that” we are helping them uncover their reasoning and logic as they describe their thinking.
- Connections – Math ideas, such as the idea of number, connect from concept to concept as we build skills and understanding. Rote counting transitions to rational counting; Identification of simple shapes morphs into understandings of part-part whole; Forming small groups of under 5 objects becomes the basis for operations.
- Communication- Raising awareness about the Language of Math in daily conversations, attending to precision in math terms, and expanding children’s math vocabulary are natural ways to increase comfort with math concepts
- Representation- Math ideas can be abstract, and are made real by models. In early childhood, we use lots of models- manipulatives, counters, maps, tools, to make math accessible. A key representation we focus on in early math is **Relationships**- Counting, for example is a One-Plus Relationship. The ideas of More, Less, Bigger, Smaller—only make sense when we compare the *relationship* of one thing to another.

#### Representation and Relationships in Unit 3

Unit 3 builds on children’s understandings of representing math relationships through intentional design and active engagement. Here are just a few of the Activities that help children make math relationships visible through representation:

- Measuring Activities and Exploring Measuring Tools- Associating numbers/ materials.
- Making groups with counters, manipulatives and people- The Umbrella/Raindrop Game
- Making maps- Rosie’s Walk activities
- Composing and De-composing Numbers (relationships) the Inside/Outside Game
- Acting out Story Ideas that Focus on Numbers- The Big Storm; Goldilocks
- Seriation- the relationship of Big, Medium and Small.- Goldilocks, SWPL

\*For more information, refer to National Council for Teachers of Mathematics [NCTM] (2000). Principles and Standards for School Mathematics pp. 52-71. Reston, VA: NCTM. OR Visit their website as [www.nctm.org](http://www.nctm.org)